OPEN ACCESS

Frailty is associated with 30-day mortality: a multicentre study of Swedish emergency departments

Samia Munir Ehrlington, Erika Hörlin, Rani Toll John, Jens Wretborn, Daniel Wilhelms

Handling editor Mary Dawood

► Additional supplemental material is published online only. To view, please visit the journal online (https://doi.org/10.1136/emermed-2023-213444).

Emergency Department, Linköping University Hospital, Linkoping, Östergötland, Sweden

Correspondence to
Dr Samia Munir Ehrlington; samia.munir.ehrlington@regionostergotland.se

Received 22 June 2023
Accepted 9 July 2024
Published Online First 24 July 2024

ABSTRACT

Background Older patients living with frailty have an increased risk for adverse events. The Clinical Frailty Scale (CFS) is a 9-point frailty assessment instrument that has shown promise to identify frail emergency department (ED) patients at increased risk of adverse outcomes. The aim of this study was to investigate the association between CFS scores and 30-day mortality in an ED setting when assessments are made by regular ED staff.

Method This was a prospective multicentre observational study carried out between May and November 2021 at three EDs in Sweden, where frailty via CFS is routinely assessed by ED staff. All patients ≥65 years of age were eligible for inclusion. Mortality at 7, 30 and 90 days, admission rate, ED and hospital length of stay (LOS) were compared between patients living with frailty (CFS≥5) and robust patients. Logistic regression was used to adjust for confounders.

Results A total of 1840 ED visits of patients aged ≥65 years with CFS assessments done during the study period were analysed, of which 606 (32.9%) were patients living with frailty. Mortality after the index visit was higher in patients living with frailty at 7 days (2.6% vs 0.2%), 30 days (7.9% vs 0.9%) and 90 days (15.5% vs 2.4%). Adjusted ORs for mortality for those with frailty compared with more robust patients were 9.9 (95% CI 2.1 to 46.5) for 7-day, 6.0 (95% CI 3.0 to 12.2) for 30-day and 5.7 (95% CI 3.6 to 9.1) 90-day mortality. Patients living with frailty had higher admission rates, 58% versus 36%, a difference of 22% (95% CI 17% to 26%), longer ED LOS, 5 hours:08 min versus 4 hours:36 min, a difference of 31 min (95% CI 14 to 50), and longer in-hospital LOS, 4.8 days versus 2.7 days, a difference of 2.2 days (95% CI 1.2 to 3.0).

Conclusion Patients living with frailty, had significantly higher mortality and admission rates as well as longer ED and in-hospital LOS compared with robust patients. The results confirm the capability of the CFS to risk stratify short-term mortality in older ED patients.

Trial registration number NCT04877028.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Assessed frailty has been associated with adverse outcomes in various settings. However, frailty assessments have primarily been made by research personnel. There has been no multicentre evaluation of whether Clinical Frailty Scale (CFS) assessment, conducted exclusively by emergency department (ED) personnel as part of their clinical work, is associated with adverse events in non-selected ED patients.

WHAT THIS STUDY ADDS

⇒ This prospective observational study was conducted in three emergency departments in Sweden where staff routinely assess CFS. Frailty (CFS≥5) was associated with increased mortality at 7, 30 and 90 days, higher admission rates and longer ED and hospital length of stay compared with robust patients.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Frailty assessments made by ED personnel can identify those at higher risk of poor outcomes, and could be used to enable more appropriate and individualised interventions.

Linked

► http://dx.doi.org/10.1136/emermed-2024-213906

Check for updates

To cite: Munir Ehrlington S, Hörlin E, Toll John R, *et al*. *Emerg Med J* 2024;**41**:514–519.

BACKGROUND

Worldwide, the proportion of adults aged over 65 is expected to increase from 8.5% in 2015 to nearly 25% by 2050.[1] This demographic shift affects all parts of the healthcare system, including the emergency department (ED). In the ED, increased numbers of older patients with extensive medical histories and a need for functional support, known as a syndrome of frailty, pose complex challenges.[2] Frail individuals are in a state of vulnerability and carry an increased risk for adverse events, including falls or other accidents, hospitalisation and mortality.[3] Unfortunately, many EDs fail to identify and address the specific needs of patients living with frailty.[4] Importantly, chronological age is not necessarily accompanied by frailty;[5] therefore, identification of older patients at risk of adverse events based on frailty assessment is an appealing concept to guide ED care and resource utilisation. Robust older patients may tolerate, and benefit from, advanced medical interventions, while care for those living with severe frailty may focus more on improving the quality of life.[6]

Out of the many existing tools for frailty assessment,[7] the Clinical Frailty Scale (CFS)[8] has been recommended for use in the ED due to its practicality in a busy environment.[9] The CFS was developed to screen for frailty in patients ≥65 years of age and assess the patient's morbidity, cognitive status and functional level in daily life. The scale ranges from 1 point (very fit) to 9 points (terminally ill). The cut-off for frailty was set at 5 points;[8] those with a CFS≥5 points are considered frail.[10] Further, a stepwise increase in the risk of 1-year mortality

for each additional frailty level on the CFS has been shown in ED patients,[11] but, there is no data on whether, compared with dichotomisation, the CFS score further differentiates patients regarding short-term term mortality.

The ability of the CFS to determine which ED patients are most likely to have poor outcomes has previously been investigated. However, these studies have largely only investigated specific patient groups.[12] In studies with non-selected patients, the assessors of frailty have primarily been research personnel;[9 13 14] this methodology could affect the generalisability of the results to routine clinical practice. The two pre-existing studies where ED staff exclusively performed the frailty assessments were both single-centre with one of the studies focusing specifically on a patient group living with frailty under low socioeconomic circumstances.[15 16]

This multicentre study determined whether there is an association between CFS, as assessed by regular ED staff in a non-select population of patients of older age with short and long-term mortality, hospital admission and ED length of stay (LOS).

MATERIALS AND METHODS

Study design and setting

This was a prospective multicentre study carried out in three Swedish EDs: Linköping ED (university hospital), Norrköping ED (urban community hospital) and Motala ED (rural community hospital). Annual visits in Linköping and Norrköping are approximately 50 000 each while Motala has around 25 000. The collection period was May/June in Linköping, and October/November in Norrköping and Motala.

The council of Region Östergötland in Sweden had previously decided to implement CFS for clinical use, and the instrument had recently been introduced in the participating EDs. During the year leading up to the introduction and study start, all clinical staff at the included EDs, that is, physicians, registered nurses and assistant nurses, were encouraged to complete an e-learning educational course on the CFS as part of their continuing medical education. The content of the course was based on the online training module developed by the Aging Innovation in perioperative Medicine & Surgery (AIMS) research group at Ottawa Hospital, Canada.[17] Three clinical vignettes were included, along with the basic theoretical concept of frailty and its consequences for patients' health and function. Staff began performing the CFS assessments and collecting the data on a worksheet at the start of the study period.

The study was registered on ClinicalTrials.gov.

Selection of participants

Patients ≥65 years of age were eligible for the study and included if the data collection worksheet was complete.

Methods of measurement

A worksheet (online supplemental appendix 1) was added to the ED records for all patients ≥65 years old when admitted to the ED. The CFS assessments were performed at all hours and were done by one of the members of the clinical team responsible for the patient (typically a physician, registered nurse or assistant nurse) and could be carried out at any time during the patient's stay in the ED. The CFS assessment date, the patient's social security number and the clinical role of the assessor were all compulsory fields on the assessment sheet for the patient's inclusion in the study. A member of the research team manually collected and reviewed the worksheets. If the worksheet was incomplete, the patient was excluded from the study.

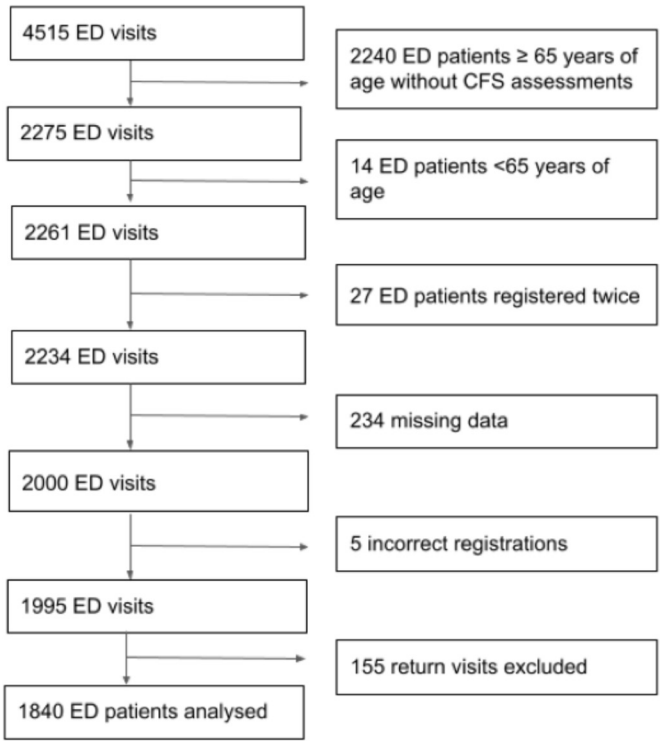


Figure 1 Flowchart describing the inclusion process. CFS, Clinical Frailty Scale; ED, emergency department.

We used the validated Swedish version of the CFS (CFS-9),[18] and included the pictograms from the original version.[19] Inter-rater reliability (IRR) was not assessed in this study, but our group has previously evaluated CFS and shown 'good' IRR.[20]

As the assessment was part of clinical care, staff had access to standard clinical information (eg, patient, relative or caregiver, and notes from the electronic medical records) and were allowed to discuss the CFS score within the treatment team.

The worksheets were stored in a locked space without access for unauthorised personnel and the digital data recorded from the documents were kept in a protected network storage space.

Outcome measures

The primary outcome was 30-day mortality. Secondary outcomes were 7-day and 90-day mortality, hospital admission and LOS in the ED and hospital.

Statistical analysis

The sample size was estimated prior to data collection using G*Power.[21] The calculation assumed a 90-day mortality of 12% in patients living with frailty (defined as CFS≥5) and 8% in robust patients ≥65 years, based on an overall mortality of 10% at 90 days in patients ≥65 years (calculated from the Swedish Emergency Care Register). With a 95% CI, a power of 0.8, and a 10% margin to account for exclusions, loss to follow-up etc, a sample size of at least 1800 patients was required.

Outcome data based on the patient's social security number was exported after all patients completed the follow-up period, from the electronic health records, which crosslinks mortality data from the national patient registry. The study cohort was divided into living with frailty (CFS≥5) or robust (CFS<5). Descriptive statistics were reported as medians for continuous variables and percentages for categorical variables. Mortality risk and hospital admission were analysed using logistic regression

Table 1 Descriptive characteristics of the study cohort

	Robust (CFS<5)	Living with frailty (CFS≥5)
n	1234	606
Age, median (IQR)	76 (71–82)	83 (77–89)
Women (%)	642 (52)	364 (60)
CFS, median (IQR)	3 (2–4)	6 (5–7)
Mode of arrival		
Ambulance	513 (41.5%)	463 (76.4%)
Walk-in	692 (56.1%)	128 (21.1%)
Recumbent patient transport	9 (0.7%)	10 (1.7%)
Other	2 (0.2%)	–
Missing data:	18 (1.5%)	5 (0.8%)
Triage category		
1 (immediate)	50 (4%)	57 (9.4%)
2 (very urgent)	347 (28%)	234 (38.6%)
3 (urgent)	633 (51.3%)	257 (42.4%)
4 (non-urgent)	203 (16.5%)	56 (9.2%)
Missing data	1 (0.08%)	2 (0.17%)
ED discharge diagnosis		
Injury*	250 (20.3%)	141 (23.3%)
Fever	28 (2.3%)	33 (5.5%)
Dyspnoea	46 (3.7%)	28 (4.6%)
Chest pain	91 (7.4%)	29 (4.8%)
Abdominal pain	61 (4.9%)	17 (2.8%)
Pneumonia	14 (1.1%)	14 (2.3%)
Heart failure	17 (1.4%)	19 (3.1%)
Vertigo	49 (4.0%)	18 (3.0%)
Syncope	22 (1.8%)	10 (1.7%)
Disorientation	4 (0.3%)	11 (1.8%)
Fatigue	11 (0.9%)	12 (2.0%)
Other	640 (51.9%)	273 (45.1%)

CFS, Clinical Frailty Scale; ED, emergency department.

with and without adjusting predefined confounders; age (continuous), sex (male or female), mode of arrival (ambulance/recumbent patient transport or walk-in) and acuity (1 through 4, with 1 being immediate) based on the Rapid Emergency Triage and Treatment System triage system used in all three EDs.[22] The mortality risk is reported as ORs for living with frailty versus robust (1 df) and in a secondary analysis for each score of the scale (8 df).

The association between frailty and LOS in the ED and hospital, treated as medians, was assessed with frailty as a dichotomous variable using the Mann-Whitney U test. CIs for LOS were estimated using bootstrapping with replacement for 1000 iterations. A p value <0.05 with a 95% CI not crossing 1 was classified as statistically significant for the main analysis. In the secondary multivariate analysis, when adjusting for confounders, a p value <0.003 was classified as statistically significant to account for multiple comparisons based on a Bonferroni correction of $m=15$. Data was imported into Pandas (V.0.23)[23] and analysed with Python using the Scipy library (V.1.17)[24] and the Statsmodels library (V.0.12).[25]

Patient and public involvement

Patients were not involved in the planning of this study.

RESULTS

Characteristics of the study subjects

There were 2275 ED visits with CFS assessments during the study period. Of these, 435 were excluded, leaving 1840 index visits eligible for analysis (figure 1). The main reasons for exclusion were missing data (234) or return visits (155). Most assessments were made by nurses or assistant nurses (53.5% and 43.0%, respectively), with 3.4% by physicians.

The median age of the study cohort was 78 (IQR 73–85), and 54.6% were women. During the study period, an additional 2240 visits by patients ≥65 years of age were registered at the EDs but were not assessed for CFS. The eligible but missed patients had a median age of 76 (71–82), and 51% were women.

Of the 1840 patients, 606 (32.9%) were living with frailty. Patients living with frailty were older (mean age 83 years vs 76 years in robust patients), higher proportion arrived by ambulance (76.4% vs 41.5%) (table 1). A higher proportion of patients living with frailty had triage levels 1 (immediate) and 2 (very urgent) compared with robust patients.

Main results

Mortality

All patients in the cohort had follow-up until 90 days. The crude 30-day mortality was 3.2%; no patients died during the ED stay. Mortality at 30 days was significantly higher in patients living with frailty compared with robust patients: 7.9% versus 0.9% (diff 7%, 95% CI for the difference 4.8% to 9.2%), as well as at 7 and 90 days (table 2). The unadjusted ORs for mortality in patients living with frailty compared with robust patients were 16.7 (95% CI 3.8 to 72.9), 9.6 (95% CI 4.9 to 18.6) and 7.6 (95% CI 5.0 to 11.7) for 7-day, 30-day and 90-day mortality, respectively. The increased risk persisted after adjusting for confounders, with ORs of 10.7 (95% CI 2.3 to 50.5), 6.0 (95% CI 3.0 to 12.3) and 6 (95% CI 3.6 to 9.1) for 7-day, 30-day and 90-day mortality, respectively (table 3). The OR for 30-day mortality increased by 2.1 (95% CI 1.7 to 2.4, p<0.001), with each additional step in CFS, in the regression analysis (figure 2).

Admission and length of stay

The overall admission rate was 43.5% in the cohort. Patients living with frailty had significantly higher admission rates compared with robust patients (58% vs 36%, diff 22%, 95% CI 17% to 26%) with an unadjusted OR of 2.4 (95% CI 2.0 to 3.0) (table 2). Patients living with frailty had a higher admission rate and longer lengths of ED and hospital stay (figure 3A,B).

Patients living with frailty had longer ED LOS and hospital LOS compared with robust patients (table 2).

DISCUSSION

In this multicentre study conducted in three EDs in Sweden, patients living with frailty (CFS≥5) had a significantly higher risk of death at 7, 30 and 90 days compared with robust patients. Patients living with frailty also had a higher admission rate and longer lengths of ED and hospital stay. These results are in line with previous data when trained research personnel assessed frailty[14 26] and confirm that frailty assessments can be made by regular ED staff.

The ORs for mortality changed little when adjusting for confounding predictors of death, like triage acuity, arrival by ambulance and age. This suggests that CFS carries prognostic information beyond common indicators for worse outcomes and may be missed if not considered. Furthermore, the mortality risk increased with the CFS score. Hence, the concept of frailty, using

Table 2 Mortality, admission and ED and in-hospital length of stay

	Robust (CFS<5) n=1234	Living with frailty (CFS≥5) n=606	Difference (95% CI)	Unadjusted OR (95% CI)	P value
Mortality					
7 days	2 (0.16%)	16 (2.6%)	2.4% (1.2% to 3.8%)	16.7 (3.8 to 72.9)	<0.001*
30 days	11 (0.9%)	48 (7.9%)	7% (4.8% to 9.2%)	9.6 (4.9 to 18.6)	<0.001*
90 days	29 (2.4%)	94 (15.5%)	13.1% (10.2% to 16.2%)	7.6 (5 to 11.7)	<0.001*
Admission	448 (36%)	352 (58%)	22% (17% to 26%)	2.4 (2.0 to 3.0)	<0.001*
ED length of stay in hours and minutes, median (IQR)	4 hours:36 min (3 hours:04 min – 6 hours:17 min)	5 hours:08 min (3 hours:40 min – 6 hours:45 min)	31 min (14–50)	–	<0.001†
Hospital length of stay in days (median, IQR)	2.7 days (1.2–5.1 days)	4.8 days (1.9–8.8 days)	2.2 days (1.2–3.0)	–	<0.001†

*Regression analysis.
†Mann-Whitney U test.
CFS, Clinical Frailty Scale; ED, emergency department.

the CFS, are potentially useful tools to risk-stratify older patients in the ED that current triage tools may miss. This has been investigated in a study from Taiwan where Ng *et al* found the risk of undertriage in older adults in the ED decreased when incorporating CFS into the triage assessment.[23] Kaeppeli *et al* also found that CFS outperformed the Emergency Severity Index model in predicting 30-day mortality.[26]

A considerable proportion of the observed mortality is likely to be non-preventable.[24] Therefore, interventions implemented based on frailty should not mainly aim to prevent death but to possibly preserve function and improve quality of life. Higher frailty scores could point out the need for Comprehensive Geriatric Assessment (CGA) in the ED, which assesses fall risk more accurately[25] and has been shown to reduce the progress of frailty through early initiation of rehabilitation.[27] Early identification of the ED patients with the highest risk of mortality, may allow ED staff to prioritise establishing realistic goals of care and avoid possible over-investigation and inappropriate interventions[28] and perhaps also earlier initiation of medical workup.

Further research should focus on investigating ways to decrease barriers to frailty assessments, possible interventions in the ED to improve the quality of care for older patients living with frailty and potential interventions to reduce 'avoidable' mortality, possibly by targeting high-risk older patients by means of adding frailty assessment to triage scores.

Limitations

Although 50% of eligible patients arriving during the study period did not have a CFS, the completion rate of assessment (50%) compares well to previous feasibility studies.[29] We previously found that high workload, critical illness and simply forgetting to do the assessment were the most common reasons patients were not assessed.[30] There may also be selective recruiting by staff. In this study, eligible but not assessed patients had a slightly lower mean age, similar to the age of robust patients. Staff may be less inclined to include younger or robust-appearing patients as the intention of the CFS is to identify frailty rather than robustness. Since the majority of included patients were robust, including more robust-appearing patients might have affected the overall mortality rate, but not the difference between groups.

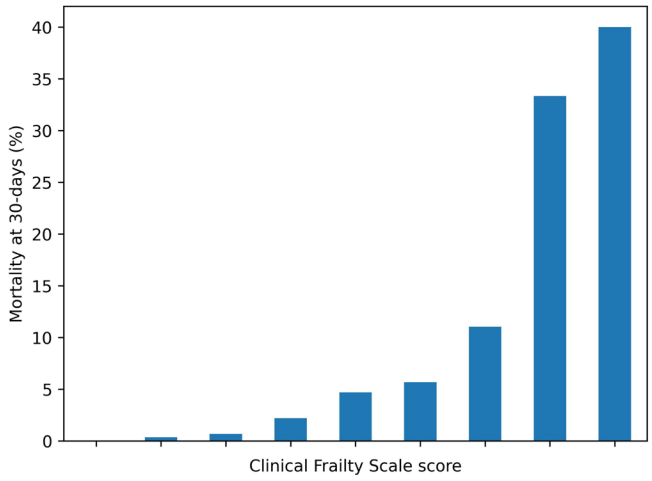
The mortality rate was lower compared with the estimated rates in the sample size calculation. However, the difference between the groups was also larger than expected, and so the net effect on the power of the study was negligible.

We did not collect data on staff experience with the CFS prior to our study, and we did not have an expert reference for the assessments, which could affect the validity and reproducibility of CFS scores. However, the aim of this study was to investigate the association of CFS with adverse outcomes in a clinical ED setting where the amount of staff training familiarity, and awareness of specific procedures will inevitably vary.

Table 3 Multivariate logistic regression results for mortality

	7-day n=16 Follow-up 100%		30-day n=48 Follow-up 100%		90-day n=94 Follow-up 100%	
Mortality	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value
Acuity						
1	2.9 (1.0 to 8.8)*	0.06	4.9 (1.3 to 19.3)	0.02	2.7 (1.2 to 6.2)	0.02
2			2.5 (0.7 to 8.6)	0.2	1.3 (0.6 to 2.6)	0.5
3	Referent		1.2 (0.3 to 4.2)	0.8	0.8 (0.4 to 1.6)	0.5
4			Referent		Referent	
CFS≥5	10.7 (2.3 to 50.5)	0.003	6.0 (3.0 to 12.3)	<0.001	6 (3.6 to 9.1)	<0.001
Age	1.1 (1.0 to 1.1)	0.1	1.04 (1.0 to 1.1)	0.02	1.03 (1.0 to 1.1)	0.05
Arrival by ambulance	1.2 (0.3 to 4.8)	0.8	1.5 (0.7 to 3.3)	0.3	1.4 (0.9 to 2.4)	0.2
Sex	2.01 (0.77 to 5.22)	0.2	1.6 (0.9 to 2.7)	0.1	1.6 (1.1 to 2.4)	0.01

*Acuity levels combined due to few outcomes for 7-day mortality.
CFS, Clinical Frailty Scale.



	1	2	3	4	5	6	7	8	9
Deaths	0	1	3	7	12	10	16	8	2
Total	191	283	441	319	256	176	145	24	5

Figure 2 Mortality for each Clinical Frailty Scale score at 30 days.

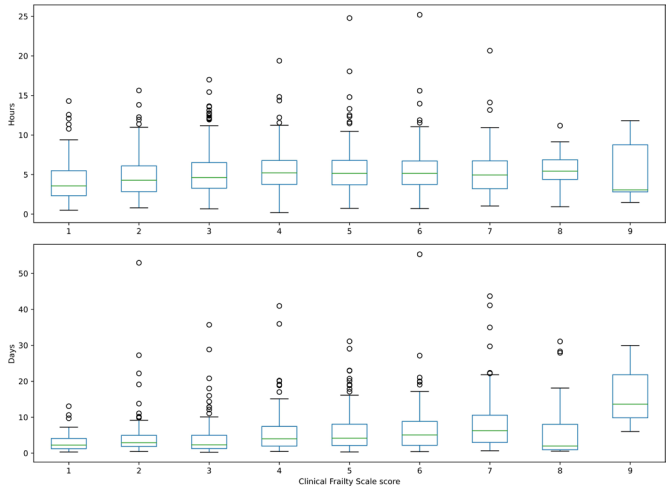


Figure 3 (A) Emergency department length of stay in hours by CFS score; (B) Hospital length of stay in days by CFS score, of all admitted patients in the study cohort. CFS, Clinical Frailty Scale.

The CFS assessment was not done at a prespecified time in the ED. If completed prior to admission, the CFS could have potentially affected the admission decision. However, the CFS was not a routine part of the admission process before or during the study and the overall admission rate in the study did not differ from the historical admission rate in this patient group which indicates little or no impact.

CONCLUSION

In this multicentre study from Sweden, patients living with frailty, as assessed with CFS by ED providers, had notably higher hospital, 7-day and 30-day mortality. The rate of admission and ED and in-hospital LOS were also higher compared with robust patients. This suggests that frailty can be assessed routinely in the ED and may be a useful additional tool in risk-stratifying patients.

Correction notice In September 2024, this paper was resupplied under a CC-BY open access licence.

Contributors SME and DW conceived and designed the study. DW, RTJ, EH and SME obtained permits. EH, RTJ and SME conducted the data collection. SME and JW analysed the data. SME and JW drafted the manuscript. DW, EH and RTJ contributed to its revision. DW acted as guarantor.

Funding This research was funded by Region Östergotland, a tax-funded public healthcare organisation, grant # RÖ-965951.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval Name of the Ethics Committee: Swedish Ethical Review Authority. Reference no: 2021-00875. Informed consent was waived by the Ethical Review Authority as Clinical Frailty Scale assessment already was introduced into clinical routine.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request. There is no plan to share individual participant data. Personal data related to this study is available upon request. Electronic data is stored in a protected network storage space. The worksheets are stored in a locked space without access for unauthorised personnel.

ORCID iD

Samia Munir Ehrlington http://orcid.org/0000-0001-6769-106X

REFERENCES

1 He W, Goodkind D, Kowal P. *An aging World: 2015*. National Institute on Aging, 2016.
2 Samaras N, Chevalley T, Samaras D, *et al*. Older patients in the emergency department: a review. *Ann Emerg Med* 2010;56:261–9.
3 Xue QL. The frailty syndrome: definition and natural history. *Clin Geriatr Med* 2011;27:1–15.
4 Shankar KN, Magauran BG, Kahn JH. Geriatric emergencies. *Emerg Med Clin North Am* 2016;34:xvii–xviii.
5 Khan KT, Hemati K, Donovan AL. Geriatric physiology and the frailty syndrome. *Anesthesiol Clin* 2019;37:453–74.
6 Cesari M, Calvani R, Marzetti E. Frailty in older persons. *Clin Geriatr Med* 2017;33:293–303.
7 Theou O, Campbell S, Malone ML, *et al*. Older adults in the emergency department with frailty. *Clin Geriatr Med* 2018;34:369–86.
8 Rockwood K. A global clinical measure of fitness and frailty in elderly people. *Can Med Assoc J* 2005;173:489–95.
9 Lewis ET, Dent E, Alkhouri H, *et al*. Which frailty scale for patients admitted via emergency department? A cohort study. *Arch Gerontol Geriatr* 2019;80:104–14.
10 Church S, Rogers E, Rockwood K, *et al*. A scoping review of the clinical frailty scale. *BMC Geriatr* 2020;20:393.
11 Rueegg M, Nissen SK, Brabrand M, *et al*. The clinical frailty scale predicts 1-year mortality in emergency department patients aged 65 years and older. *Acad Emerg Med* 2022;29:572–80.
12 Fehlmann CA, Nickel CH, Cino E, *et al*. Frailty assessment in emergency medicine using the clinical frailty scale: a scoping review. *Intern Emerg Med* 2022;17:2407–18.
13 Falk Erhag H, Guðnadóttir G, Alfredsson J, *et al*. The association between the clinical frailty scale and adverse health outcomes in older adults in acute clinical settings - a systematic review of the literature. *Clin Interv Aging* 2023;18:249–61.
14 Cardona M, O'Sullivan M, Lewis ET, *et al*. Prospective validation of a checklist to predict short-term death in older patients after emergency department admission in Australia and Ireland. *Acad Emerg Med* 2019;26:610–20.
15 Clark S, Shaw C, Padayachee A, *et al*. Frailty and hospital outcomes within a low socioeconomic population. *QJM* 2019;112:907–13.

16 Elliott A, Taub N, Banerjee J, *et al*. Does the clinical frailty scale at triage predict outcomes from emergency care for older people? *Ann Emerg Med* 2021;77:620–7.
17 AIMS. Clinical frailty scale (CFS) training module. n.d. Available: https://rise.articulate.com/share/deb4rT02lvONbq4AfcMNRUudcd6QMts3#/
18 Ekerstad N. Clinical frailty scale. 2017. Available: https://janusinfo.se/download/18.54c15e0616f53615ae5882fd/1578400633984/Clinical-Frailty-Scale-svensk.pdf
19 Dalhousie University. Clinical frailty scale. 2023. Available: https://www.dal.ca/sites/gmr/our-tools/clinical-frailty-scale.html
20 Hörlin E, Munir Ehrlington S, Henricson J, *et al*. Inter-rater reliability of the clinical frailty scale by staff members in a Swedish emergency department setting. *Acad Emerg Med* 2022;29:1431–7.
21 Faul F, Erdfelder E, Lang AG, *et al*. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behav Res Methods* 2007;39:175–91.
22 Widgren BR, Jourak M. Medical emergency triage and treatment system (METTS): a new protocol in primary triage and secondary priority decision in emergency medicine. *J Emerg Med* 2011;40:623–8.
23 Ng C-J, Chien L-T, Huang C-H, *et al*. Integrating the clinical frailty scale with emergency department triage systems for elder patients: a prospective study. *Am J Emerg Med* 2023;66:16–21.
24 Goodacre S. Using clinical risk models to predict outcomes: what are we predicting and why? *Emerg Med J* 2023;40:728–30.
25 Appeadu MK, Bordoni B. *Falls and fall prevention in older adults*. Treasure Island,FL: StatPearls Publ, 2023.
26 Kaeppeli T, Rueegg M, Dreher-Hummel T, *et al*. Validation of the clinical frailty scale for prediction of thirty-day mortality in the emergency department. *Ann Emerg Med* 2020;76:291–300.
27 Ekerstad N, Dahlin Ivanoff S, Landahl S, *et al*. Acute care of severely frail elderly patients in a CGA-unit is associated with less functional decline than conventional acute care. *Clin Interv Aging* 2017;12:1239–49.
28 Hogervorst VM, Buurman BM, De Jonghe A, *et al*. Emergency department management of older people living with frailty: a guide for emergency practitioners. *Emerg Med J* 2021;38:724–9.
29 Elliott A, Hull L, Conroy SP. Frailty identification in the emergency department-a systematic review focussing on feasibility. *Age Ageing* 2017;46:509–13.
30 Hörlin E, Munir Ehrlington S, Toll John R, *et al*. Is the clinical frailty scale feasible to use in an emergency department setting? A mixed methods study. *BMC Emerg Med* 2023;23:124.